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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,476	04/12/2004	Gregory S. Heady	FRON-10193	4582

7590 04/10/2006  
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EXAMINER
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HOFFBERG, ROBERT JOSEPH

ART UNIT	PAPER NUMBER
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2835

DATE MAILED: 04/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/823,476

Applicant(s)

HEADY, GREGORY S.

Examiner

Robert J. Hoffberg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-31 and 33-36 is/are pending in the application.
- 4a) Of the above claim(s) 1-15 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-31 and 33-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/12/04.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-15 and 32, drawn to a heat collector for an electronic display, classified in class 361, subclass 700.
  - II. Claims 16-31 and 33-36, drawn to a heat collector, classified in class 165, subclass 185.

Inventions II and I are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the heat collector can be used to cool any apparatus. The subcombination has separate utility such as a cooling system for a display screen of the electronic display.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with David Allred (Tel. 480-655-0073) on 3/16/06 a provisional election was made with traverse to prosecute the invention of Group II, claims 16-31 and 33-36. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-15 and 32 withdrawn from further

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consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Specification***

2. The disclosure is objected to because of the following informalities: Page 12, line 13, insert the application number of co-filed application.

3. Page 14, line 22 "os" should be --of--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 16-17 and 26-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Dinh (US 5,921,315).

With respect to Claim 16, Dinh teaches a heat collector, comprising: a heat sink (Fig. 7, #74) including a mass of heat conductive material (Fig. 7, #78); and a recess (Col. 6, line 33, imbedded) in the mass of material; at least a gas phase line (Fig. 7, #71) in the recess.

With respect to Claim 17, Dinh further teaches that a liquid phase line (Fig. 7, #72) in the recess.

With respect to Claim 26, Dinh further teaches a composite line (Fig. 7, #71 and #73) including a plurality of lines including said gas phase line.

With respect to Claim 27, Dinh further teaches that the composite line is received in (see Fig. 7) the recess.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dinh (US 5,921,315) as applied to the above claims in view of Nelson et al. (US 4,882,654).

With respect to Claim 18, Dinh teaches the heat collector of the above claims. Dinh fails to teach that the liquid phase line is disposed inside the gas phase line. Nelson et al. teaches the inlet line (Fig. 1, #34) is disposed inside the outlet line (Fig. 1, #36) and that fluid lines can be either liquid or gas (Col. 3, line 15). With respect to Claim 19, Nelson et al. further teaches that a downstream end (Fig. 1, #34 in #12) of the inlet line is fluidly connected to (Fig. 1, see arrows in #12) and forms a transition into the outlet line. With respect to Claim 20, Nelson et al. further teaches that the transition is adjacent to an upstream end (Fig. 1, arrow in outer tube of #28) of the outlet line. With respect to Claim 21, Nelson et al. further teaches that the inlet line is at least partially coextensive (see Fig. 1) with the outlet line. With respect to Claim 22, Nelson et al. further teaches wherein the inlet line extends along a substantial portion (Fig. 1, #34 is parallel with #32) of the outlet line. While Nelson fails to teach that the heat collector

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changes the fluid phase from a liquid to a vapor with a liquid input phase line and a gas outlet phase line, it would have been obvious that a fluid could be selected that would vaporize as the heat collector is cooling the object to be cooled. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Dinh with that of Nelson et al. for the purpose of providing a single interface attachment point for both the inlet and outlet lines.

8. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dinh (US 5,921,315) as applied to the above claims in view of Khrustalev et al. (US 2003/0010477) and further in view of Nelson et al. (US 4,882,654).

With respect to Claim 23, Dinh teaches the heat collector of the above claims. Dinh fails to teach the longitudinal recess and an opening in the heat sink. Khrustalev et al. teaches the recess is a longitudinal recess (see Fig. 11) and an opening (Fig. 11, #83) in the heat sink (Fig. 11, #36). While Khrustalev et al. teaches a longitudinal recess in a heat dissipater, the structural elements of a heat dissipater and a heat collector are the same. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Dinh with that of Khrustalev et al. for the purpose of providing the maximum path for fluid contact with the heat sink and an opening to permit the fluid to enter the heat sink. Nelson et al. teaches the opening (Fig. 1, #28) being an inlet and outlet opening. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Dinh with that of Nelson et al. for the purpose of providing a single interface attachment point for both the inlet and outlet lines.

With respect to Claim 24, Dinh fails to teach a second closed end of the recess. Khrustalev et al. further teaches a second end (Fig. 11, left side) of the recess comprises a closed end within the mass of heat conductive material. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Dinh with that of Khrustalev et al. for the purpose of providing the maximum path for fluid contact by forming a serpentine shaped recess within the heat sink.

9. Claim 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dinh (US 5,921,315) in view of Khrustalev et al. (US 2003/0010477) further in view of Nelson et al. (US 4,882,654) as applied to the above claims, and further in view of Harvey (US 3,283,811).

With respect to Claim 25, Dinh in view of Khrustalev et al. teaches the heat collector of the above claims. They fail to disclose a liquid phase line in a recess extending substantially to the closed end of the recess. Harvey et al. teaches a liquid phase line (Fig. 1, #36 and Col. 3, lines 43-44, water) in the recess (Fig. 1, inside of #38) extending substantially to the closed end of the recess; wherein the closed end (Fig. 1, #38 right end) of the recess forms a transition between the liquid phase line and the gas phase line (Fig. 1, #38 and Col. 2, line 34, superheated). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Dinh in view of Khrustalev et al. with that of Harvey for the purpose of providing a single end for the fluid lines and providing a flow path along the length of the evaporator.

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10. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dinh (US 5,921,315) in view of Nelson et al. (US 4,882,654) as applied to the above claims, and further in view of Anderson et al. (US 5,761,037).

With respect to Claim 28, Dinh in view of Nelson et al. teaches the heat collector of the above claims, but fails to disclose a manifold. Nelson et al. further teaches a manifold (Fig. 1, #16) for uniting a separate outlet line (Fig. 1, #36) and a separate inlet line (Fig. 1, #34) into the composite line (Fig. 1, #28) and the combined outlet and inlet line connection fluidly connected to the composite line. Dinh in view of Nelson et al. fail to teach a manifold having a combined gas phase and liquid phase. Anderson et al. teaches the manifold (Fig. 1, #102) having a combined gas phase and liquid phase. With regard to Claim 29, Anderson et al. further teaches that the manifold has an upstream liquid phase input connection (Fig. 2, #106) and a downstream gas phase output collection (Fig. 2, #107) separate from the liquid phase inlet connection. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Dinh in view of Nelson et al. with that of Anderson et al. for the purpose of providing a manifold having separate gas and liquid lines for use as an evaporator to maximize cooling of a component.

11. Claims 30-31 and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (US 4,882,654) in view of Anderson et al. (US 5,761,037).

With regard to Claim 30, Nelson et al. teaches a plurality of inlet and outlet lines (Fig. 1, #34, #36, #28 inner dia. and #28 outer dia) for a cooling system, comprising an



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internal outlet line (Fig. 1, #28 outer dia.); an external outlet line (Fig. 1, #36) connected to the internal outlet line; and an external inlet line (Fig. 1, #34); wherein the external inlet line and the external outlet line have substantially the same diameter (see Fig. 1) and that fluid lines can be either liquid or gas (Col. 3, line 15). With regard to Claim 31, Nelson et al. further teaches an internal inlet phase line (Fig. 1, #34). Nelson et al. fails to teach that internal and external gas and liquid phase lines and input and output connections. Anderson et al. teaches a plurality of liquid phase and gas phase lines (Fig. 4, #11 and #21, Fig. 2, #106 tube for fluid flow and #107 tube for fluid flow) for a cooling system, comprising: an internal gas phase line (Fig. 2, #107 tube for fluid flow); an external gas phase line (Fig. 4, #11) connected to the internal gas phase line; an internal liquid phase line (Fig. 2, #106 tube for fluid flow) and an external liquid phase line (Fig. 4, #21) wherein the external liquid phase line and the external gas phase line have substantially the same diameter (shown on Fig. 4). With respect to Claim 33, Anderson et al. further teaches a manifold (Fig. 1, #102); the manifold having: an input connection (Fig. 2, #106) fluidly connected to the external inlet line, an output connection (Fig. 2, #107) fluidly connected to the external gas phase line; and a combined gas phase and liquid phase (Fig. 3A, openings within #102) connection fluidly connected to the internal gas phase line and the internal liquid phase line. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Nelson et al. with that of Anderson et al. for the purpose of providing separate gas and liquid lines for use as an evaporator to maximize cooling of a component.

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With respect to Claim 34, Nelson et al. further teaches that the internal outlet line and the internal inlet line form a composite internal line (Fig. 1, within #12). Nelson et al. fails to teach gas phase and liquid phase lines. While Anderson et al. fails to teach a composite liquid and gas phase line, it does a combined gas phase and liquid phase connection. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Nelson et al. with that of Anderson et al. for the purpose of providing separate gas and liquid lines for use as an evaporator to maximize cooling of a component.

With respect to Claim 35, Nelson et al. further teaches the composite internal line has a first end (Fig. #12 opening to #28 outer dia.) fluidly connected to a manifold (Fig. 1, #16) and a second end (Fig. 1, #14) fluidly connecting the internal outlet (Fig. 1, #28 outer dia.) line to the internal inlet (Fig. 1, #28 inner dia.) line and forming a transition therebetween. With regard to Claim 36, Nelson further teaches that the internal inlet line is disposed inside (see Fig. 1) the internal outlet line. Nelson fails to teach the internal liquid and gas phase lines. Anderson et al. teaches the internal liquid phase line (Fig. 2, #106 tube for fluid flow) and internal gas phase line (Fig. 2, #107 tube for fluid flow). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the heat collector of Nelson et al. with that of Anderson et al. for the purpose of providing separate gas and liquid lines for use as an evaporator to maximize cooling of a component.

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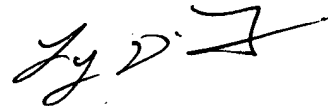

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJH



**LYNN D. FEILD  
PRIMARY EXAMINER**